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1 Profile-based optimizations: Reality-based optimization

Scott McFarling

March 2003 Proceedings of the international symposium on Code generation and runtime optimization

Full text available: pdf(1.09 MB) Publisher Site

Additional Information: full citation, abstract

Profile-based optimization has been studied extensively. Numerous papers and improvements. However, most of these papers have been limited to either benchmark performance. Also, most of these papers have looked at small applications with training scenarios. In this paper, we look at real use of large real-world desktop consumption and disk performance are the primary ...

2 Systematic Power-Performance Trade-Off in MPEG-4 by Means of Selective Address Optimization Opportunities

M. Palkovic, M. Miranda, F. Catthoor

March 2002 Proceedings of the conference on Design, automation and test in

Full text available: pdf(116.86 KB) Publisher Site


Additional Information

The hierarchical structure of real-life data dominated applications limits the extent of optimisations. This limitation is often overcome by function inlining. However, which causes a significant growth of instruction cache misses and thus performance confirmed on experiments with our applications. We have developed a novel inlining steered by cost/gain balance to trade-off ...

3 Near-optimal intraprocedural branch alignment

Cliff Young, David S. Johnson, Michael D. Smith, David R. Karger

May 1997 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1997 conference and implementation, Volume 32 Issue 5


Full text available:  pdf(1.56 MB)

Additional Information: full citation, abstract, references, cit

Branch alignment reorders the basic blocks of a program to minimize pipeline instructions. Prior work in branch alignment has produced useful heuristic method algorithm that usually achieves the minimum possible pipeline penalty and or of a provable optimum. We compare the control penalties and running times of our approach and observe that both the greedy method and ...

4 Temperature-aware microarchitecture: Modeling and implementation

Kevin Skadron, Mircea R. Stan, Karthik Sankaranarayanan, Wei Huang, Sivakum
March 2004 ACM Transactions on Architecture and Code Optimization (TACO),

Full text available:  pdf(1.42 MB)

Additional Information: full citation, abstract, references, cit

With cooling costs rising exponentially, designing cooling solutions for worst-case expensive. Chips that can autonomously modify their execution and power-dissipation of lower-cost cooling solutions while still guaranteeing safe temperature regulation. *dynamic thermal management* (DTM), however, requires a thermal model that studies. This paper describes *HotSpot* ...

Keywords: Dynamic compact thermal models, dynamic thermal management, control, fetch gating

5 TRIPS: A polymorphous architecture for exploiting ILP, TLP, and DLP

Karthikeyan Sankaralingam, Ramadass Nagarajan, Haiming Liu, Changkyu Kim, Burger, Stephen W. Keckler, Robert G. McDonald, Charles R. Moore

March 2004 ACM Transactions on Architecture and Code Optimization (TACO),

Full text available:  pdf(832.30 KB)

Additional Information: full citation, abstract, references, cit

This paper describes the *polymorphous* TRIPS architecture that can be configured for parallelism. The TRIPS architecture is the first in a class of post-RISC, data-driven data-graph execution (EDGE). This EDGE ISA is coupled with hardware mechanisms and the on-chip memory system to be configured and combined in different modes of thread-level parallelism. To adapt ...


Keywords: Computer architecture, configurable computing, scalable and high-

6 Papers: The lookahead strategy for distance-based location tracking in wire

I-Fei Tsai, Rong-Hong Jan

October 1999

ACM SIGMOBILE Mobile Computing and Communications Review,

Full text available:  pdf(1.27 MB)


Additional Information: full citation, abstract, referen

Based on a multi-scale, straight-oriented mobility model, this paper presents location tracking so the rate of location update can be reduced without incurring linear mobility graphs, the optimal registered cell is found by an iterative algorithm maximized. For planar mobility graphs, the authors employ the results from linear mobility graphs to find the optimal registered cell. Performance gain is ...

7 Aggressive inlining

Andrew Ayers, Richard Schooler, Robert Gottlieb

May 1997 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN 1997 conference and implementation, Volume 32 Issue 5

Full text available:  pdf(1.40 MB)

Additional Information: full citation, abstract, references, ci

Existing research understates the benefits that can be obtained from inlining and cloning of code blocks. Our implementation of inlining and cloning yields excellent results. We believe our good results can be explained by a number of factors. First, intermediate-code level removes most technical restrictions on what can be inlined. Second, inlining and cloning enables ...

8 Datapath and control for quantum wires

Nemanja Isailovic, Mark Whitney, Yatish Patel, John Kubiawicz, Dean Copsey, Mark Oskin

March 2004

ACM Transactions on Architecture and Code Optimization (TACO),

Full text available:  pdf(476.83 KB)

Additional Information: full citation, abstract, reference

As quantum computing moves closer to reality the need for basic architectural components for quantum computing is becoming more apparent. Quantum wires, which transport quantum data, will be a fundamental component of quantum architectures. Since they cannot consist of a stream of electrons, as in the classical case, they must be designed differently. In this paper, we present two quantum architectures for the transport of quantum data: a quantum wire for the swapping of adjacent qubits, and a teleportation wire, ...

Keywords: Architecture, Control, Layout

9 Software profiling for hot path prediction: less is more

Evelyn Duesterwald, Vasanth Bala

November 2000 Proceedings of the ninth international conference on Architectural operating systems, Volume 34 , 28 Issue 5 , 5

Full text available:  pdf(286.07 KB)

Additional Information: full citation, abstract, references,

Recently, there has been a growing interest in exploiting profile information in compilers, dynamic optimizers and, binary translators. In this paper, we show schemes that provide highly accurate information in an offline setting are ill-s systems. We experimentally demonstrate that hot path predictions must be m cost of missed opportunity tha ...

10 Advanced design and modeling techniques: Optimal design of high fan-in n nonlinear programming

Hsu-Wei Huang, Cheng-Yeh Wang, Jing-Yang Jou

January 2004 Proceedings of the 2004 conference on Asia South Pacific design aut fair 2004

Full text available:  pdf(142.54 KB)

Additional Information: full citation, abstract,

In this paper, a novel strategy for designing the heterogeneous-tree multiplex delay model by curve fitting and then formulate the heterogeneous-tree multi of optimization problem called mixed-integer nonlinear programming (MINLP) size in each stage, is introduced to improve the speed of the heterogeneous-ti can determine the multiplexer architec ...

11 Future technologies: Timing, energy, and thermal performance of three-dir

Shamik Das, Anantha Chandrakasan, Rafael Reif

April 2004 Proceedins of the 14th ACM Great Lakes symposium on VLSI

Full text available:  pdf(488.45 KB)

Additional Information: full citation, abstract, referenc

We examine the performance of custom circuits in an emerging technology kn By combining multiple device layers with a high-density inter-layer interconne expected to provide better timing and energy performance relative to a single circuit. In this paper, we show that by using our performance-driven design to dissipation of standard-cell circuits can ...

Keywords: 3-D IC, 3-D integration, energy, thermal optimization, timing

12 GADGET: a toolkit for optimization-based approaches to interface and display

James Fogarty, Scott E. Hudson

November 2003 Proceedings of the 16th annual ACM symposium on User interface

Full text available:  pdf(823.58 KB)

Additional Information: full citation, abstract, references, etc.

Recent work is beginning to reveal the potential of numerical optimization as a tool for interface and displays. Optimization-based approaches can often allow a mix of independent and dependent elements to be blended in ways that would be difficult to describe algorithmically. While optimization offers several potential advantages, further research in this area is hampered by the lack of tools. This paper presents GADGET, an experimental toolkit ...

Keywords: display generation, layout algorithms, numerical optimization, perception

13 Server performance and scalability: A smart hill-climbing algorithm for application servers

Bowei Xi, Zhen Liu, Mukund Raghavachari, Cathy H. Xia, Li Zhang

May 2004 Proceedings of the 13th international conference on World Wide Web

Full text available:  pdf(373.43 KB)

Additional Information: full citation, abstract, references, etc.

The overwhelming success of the Web as a mechanism for facilitating information exchange in business transactions has led to an increase in the deployment of complex applications, which typically run on Web Application Servers, which assume the burden of managing the state of the application, memory management, database access, etc., required by these applications. This paper describes a server that depends heavily on appropriate configuration. Co ...

Keywords: automatic tuning, gradient method, importance sampling, simulation

14 Extending Path Profiling across Loop Backedges and Procedure Boundaries

Sriraman Tallam, Xiangyu Zhang, Rajiv Gupta

March 2004 Proceedings of the international symposium on Code generation and runtime optimization

Full text available:  pdf(416.54 KB)

Additional Information: full citation, abstract, references, etc.

Since their introduction, path profiles have been used to guide the application of instruction scheduling. However, for optimization and scheduling, the frequency counts of paths that extend across loop iterations and cross procedure boundaries, referred to as interesting paths in this paper, account for over 75% of the flow. Although the frequency counts of interesting paths can be ...

Keywords: path profiles, overlapping path profiles, profile-guided optimization, static analysis

15 Placement techniques: FastPlace: efficient analytical placement using cell : a hybrid net model

Natarajan Viswanathan, Chris Chong-Nuen Chu

April 2004

Proceedings of the 2004 international symposium on Physical design

Full text available:  pdf(237.50 KB)

Additional Information: full citation, abstract, references

In this paper, we present *FastPlace* -- a fast, iterative, flat placement algorithm. *FastPlace* is based on the quadratic placement approach. The quadratic approach minimization problem as a convex quadratic program, which can be solved efficiently. However it suffers from some drawbacks. First, the resulting placement has a resulting total wirelength ...


Keywords: analytical placement, net models, standard cell placement

16 Advances in embedded software scheduling techniques: Pareto-optimization of embedded systems

Peng Yang, Francky Catthoor

October 2003

Proceedings of the 1st IEEE/ACM/IFIP international conference on Hardware-software co-synthesis

Full text available:  pdf(213.01 KB)

Additional Information: full citation, abstract, references

Pareto-set-based optimization can be found in several different areas of embedded task scheduling, where different task mapping and ordering choices for a target performance/cost tradeoffs. To explore this design space at run-time, a fast algorithm have modeled the problem as the well known Multiple Choice Knapsack Problem. A greedy heuristic for the run-time task scheduling. To ...



Keywords: Pareto optimization, embedded system, low-power, scheduling

17 Code scheduling: Phi-Predication for light-weight if-conversion

Wei-haw Chuang, Brad Calder, Jeanne Ferrante

March 2003

Proceedings of the international symposium on Code generation and runtime optimization

Full text available:  pdf(1.19 MB)  Publisher Site


Additional Information: full citation, abstract

Predicated execution can eliminate hard to predict branches and help to enable current predication variants exist where the result update is conditional based predicate. However, conditional writing of a register creates a naming problem stall the issuing of instructions. This problem arises from potential multiple pr which is unresolved until the prior ...

18 A comparative study of static and profile-based heuristics for inlining

Matthew Arnold, Stephen Fink, Vivek Sarkar, Peter F. Sweeney

January 2000 ACM SIGPLAN Notices , Proceedings of the ACM SIGPLAN workshop on optimization, Volume 35 Issue 7

Full text available:  pdf(1.13 MB)

Additional Information: full citation, abstract, references, etc.

In this paper, we present a comparative study of static and profile-based heuristics for inlining. Our motivation for this study is to use the results to design the inlining heuristics for the Jalapeño dynamic optimizing compiler for Java [6]. We compare the performance of an approximation algorithm for the KNAPSACK problem as a communication heuristic with a "meta-algorithm" for the inlining heuristics studied in this paper. The performance results for an implementation of these inlining heuristics are presented.

19 Database theory, technology and applications (DTTA): On the semantics and complexity of query languages for NP search and optimization problems

E. Zuppano, S. Greco, I. Trubitsyna, P. Veltri

March 2004 Proceedings of the 2004 ACM symposium on Applied computing

Full text available:  pdf(233.87 KB)

Additional Information: full citation, abstract, references, etc.

It has been shown that NP (decision, search and optimization) problems can be expressed in Datalog with unstratified negation) queries under stable model semantics. This is often neither simple nor intuitive and, besides, DATALOG does not allow to express the full expressive power. This paper analyzes the power of Datalog-like languages in expressing NP problems. In more detail, in the next section.

Keywords: datalog, deductive and logic databases, expressive power of query languages

20 Positional adaptation of processors: application to energy reduction

Michael C. Huang, Jose Renau, Josep Torrellas

May 2003 ACM SIGARCH Computer Architecture News , Proceedings of the 30th annual ACM SIGARCH Computer architecture, Volume 31 Issue 2

Full text available:  pdf(225.57 KB)

Additional Information: full citation, abstract, references, etc.

Although adaptive processors can exploit application variability to improve performance, managing their adaptivity is challenging. To address this problem, we introduce the *Positional* approach. In this approach, both the *testing* of configurations and the *adaptation* of configurations are associated with particular code sections. This is in contrast to the traditional approach to adaptation ...

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[Procedure Mapping Using Static Call Graph Estimation - Hashemi, Kaeli, Calder \(1997\) \(Correct\) \(1 citation\)](#)
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[Reproducing Inter-Process Synchronization for Performance... - Burton, Kelly \(Correct\)](#)
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rapidly construct tools to collect and visualize **profile data** from the execution of object-oriented construct tools to collect and visualize **profile data** from the execution of object-oriented programs. For example, by examining the behaviour of hot **data** fields and the relationships between field
www.sable.mcgill.ca/step/OOPSLA01/OOPSLA01_stoop-abs.ps.gz

[Commercializing Profile-Driven Optimization - Stan Cox David \(1995\) \(Correct\) \(1 citation\)](#)
Commercializing **Profile**-Driven Optimization J. Stan Cox David P. Stan Cox David P. Howell Thomas M. Conte y Database and Compiler Technology y Department of system code and support debugging. In general, the **data** and techniques presented in this paper can be used
www.finker.ncsu.edu/symposia/hicss95b.ps

[Overview of the Cecil/Vortex Project - Chambers \(1995\) \(Correct\)](#)
We are investigating the following approaches: **Profile**-guided optimization. We are studying how dynamic and immutable variables. A rich library of standard **data** structures has been constructed. As of Spring both for runs of the same program on different **data** sets and for different versions of a program.
www.cs.washington.edu/research/projects/cecil/www/www/Overview/overview.ps

[Profile-Based Optimization with Statistical Profiles - Nick Gloy \(1997\) \(Correct\) \(3 citations\)](#)
Profile-Based Optimization with Statistical Profiles
www.eecs.harvard.edu/smith/papers/tr-02-97.ps

[Checking Program Profiles - Patrick Moseley Saumya \(2003\) \(Correct\)](#)
Checking Program **Profiles** Patrick Moseley Saumya Debray Gregory
www.brunel.ac.uk/~csstmnh2/scam2003/p5.ps

[Using Profile Information to Assist Classic Code Optimizations - Chang \(1991\) \(Correct\) \(72 citations\)](#)

Using **Profile** Information to Assist Classic Code

to use **profile** information. Experimental **data** show that these code optimizations can

[17]Design Overview Box C. Box B. Box A. Input **Data** Host Assemblers **Profiler** Amd29k I860 Sparc Mips
[ftp://crhc.uiuc.edu/pub/IMPACT/journal/spe.profile-classic.91.ps](http://crhc.uiuc.edu/pub/IMPACT/journal/spe.profile-classic.91.ps)

Verifying Program Profiles - Patrick Moseley, Saumya (Correct)

Verifying Program Profiles Patrick Moseley, Saumya Debray, Gregory

www.cs.arizona.edu/people/debray/papers/trap-verifier.ps

A Procedure for Estimating Cluster Boundaries in Gene... - Horimoto, Toh (2000) (Correct) (1 citation)

Estimating Cluster Boundaries in Gene Expression **Profile Data** Katsuhisa Horimoto 1 Hiroyuki Toh 2

Cluster Boundaries in Gene Expression **Profile Data** Katsuhisa Horimoto 1 Hiroyuki Toh 2

factor 1 Introduction Gene expression **profile data** are rapidly accumulated by the advance of

www.jsbi.org/journal/GIW00/GIW00P008.pdf

Data Collection in a Process-Sensitive Software... - Giese, Hoisl, Lott... (1994) (Correct)

Data Collection in a Process-Sensitive Software

may be tested in the project empirically, and **data** must be collected and analyzed. Empirical **data** and **data** must be collected and analyzed. Empirical **data** allows us to characterize projects, gauge

www.cs.urnd.edu/users/cml/work/pubs/1994-ispw9.ps.gz

Efficient Path Profiling - Ball, Larus (1996) (Correct) (91 citations)

larus@cs.wisc.edu Abstract A path **profile** determines how many times each acyclic path in a

profiling shows that the SPEC95 train input **datasets** covered most of the paths executed in the ref covered most of the paths executed in the ref **datasets**. This research supported by: Wright

www.stanford.edu/class/cs343/ps/pathprof.ps

A Quantitative Study of Differentiated Services for the... - Sahu, Towsley, Kurose (1999) (Correct) (20 citations)

should forward packets that fall outside of the "**profile**" it has negotiated with the sender. Prior to

gaia.cs.umass.edu/pub/Sahu99_Diffserv-TR-99-09.ps.gz

On Profile Likelihood - Murphy, van der Vaart (1998) (Correct)

On **Profile** Likelihood By S.a. Murphy 1 And A.w. Van Der

The Proportional Hazards Model for Current Status **Data** Under "current status" censoring a subject is bounded variation. Let F com t be the "complete **data**" sigma field generated by $fG N j (s) Y j (s) Z$

www.stat.lsa.umich.edu/~samurphy/profile.ps

Integrated Profile Management for Mobile Computing - Alessandra Agostini Claudio (Correct)

Integrated **Profile** Management for Mobile Computing #Alessandra

for the integrated management of **profile data** and propose a high-level description of its

that are more feasible for providing **profile data**, and propose a mechanism for retrieving and

homes.dico.unimi.it/~riboni/ai2la03.pdf

Ephemeral Instrumentation for Lightweight Program Profiling - Traub, Schechter, Smith (2000) (Correct) (13 citations)

instrumentation and show that it collects useful **profiles** with low overhead. This approach builds on ideas

gathering branch biases and post-processing that **data** into a traditional edge **profile**. We evaluate the

low overheads (1-5% while acquiring **profile data** that rivals the usefulness of complete **profiles**

www.eecs.harvard.edu/~hubs/publications/pldi00.pdf

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Hardware-Based Profiling: An Effective Technique for Profile-Driven Optimization (1996) (Make Corrections) (7 citations)

Thomas M. Conte, Burzin Patel, Kishore N. Menezes, J. Stan Cox
International Journal of Parallel Programming



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Abstract: Profile-based optimizations can be used for instruction scheduling, loop scheduling, data preloading, function in-lining, and instruction cache performance enhancement. However, these techniques have not been embraced by software vendors because programs instrumented for profiling run significantly slower, an awkward compile-run-recompile sequence is required, and a test input suite must be collected and validated for each program. This paper introduces hardware-based profiling that uses... ([Update](#))

Context of citations to this paper: [More](#)

...driven optimizing compiler. **Although hardware based profiling achieves very little slowdown, it provides less than ideal profiles [8] [9].** This is due to the small size of the branch prediction hardware [8] and the relatively coarse grain nature of current branch...

...suggested to aid in dynamic optimizations. **5] and [4] propose modifications to commodity hardware to enable profiling, while [3] suggests using the branch target buffer found on modern commodity microprocessors for this purpose.** ROE can be thought of as a system that...

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Dynamic Optimization through the use of Automatic Runtime.. - Whaley (1999) ([Correct](#))

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4: Using profile information to assist classic compiler code optimizations - Chang, Mahlke et al. - 1991

3: Optimally profiling and tracing programs - Ball, Larus - 1992

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[More](#)

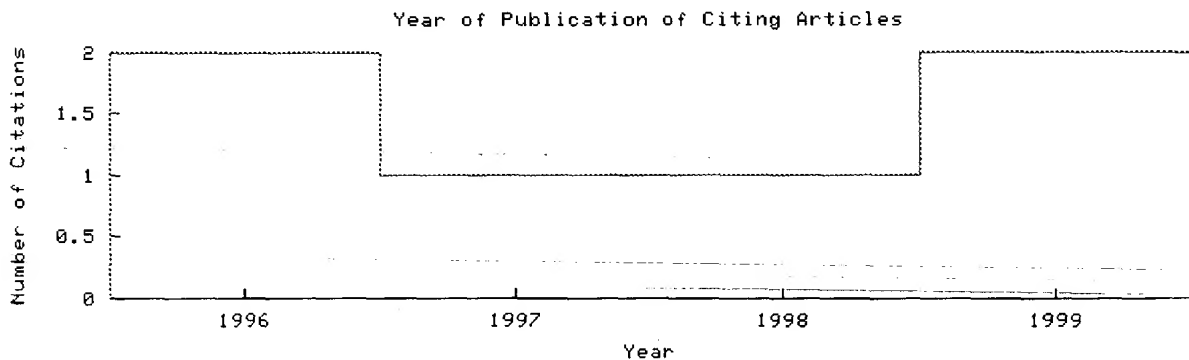
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  journal = "International Journal of Parallel Programming",
  volume = "24",
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